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MEDICAL OPERATIONS IN DENIED ENVIRONMENTS (MODE):

ARE OUR AF MEDICS READY?

by

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A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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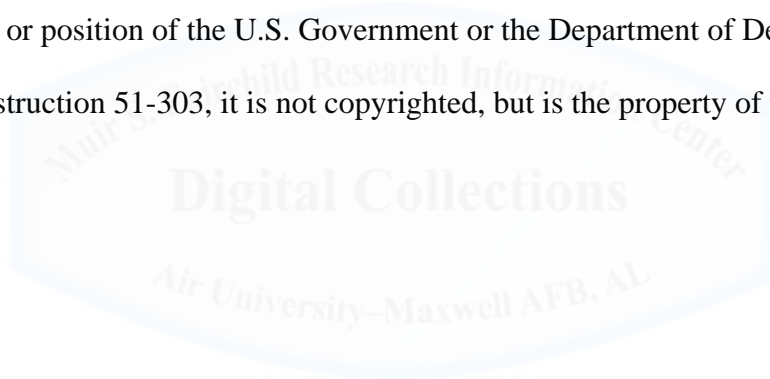
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Table of Contents

List of Figures:

INTRODUCTION

"As a global power with global interests, the United States must maintain the credible capability to project military force into any region of the world in support of those interests. While the requirement for operational access applies to any mission, the most difficult access challenge— and therefore the subject of this concept—is operational access contested by armed opposition."

Joint Operational Access Concept, January 2012[1]

A notable security threat that has garnered much attention in recent years is the development of anti-access/area denial (A2/AD) capabilities by international actors. In the 2015 National Military Strategy, the Chairman of the Joint Chief of Staff describes the international environment as fraught with uncertainty and characterized by rapid change and evolving security threats at all levels.[2] A2/AD reflects a set of capabilities used by an actor to project power and reduce access over a geographical area. The development of these capabilities generates concern amongst national security analysts as they have the potential to effectively reduce the United States' ability to project power or operate freely within the global commons. This threat cannot be taken too lightly. The United States' ability to project power is an enduring requirement.[3] The U.S. military must counter this threat by meeting the Chairman's appeal for a military that is agile, innovative, and integrated.[4]

As with other military capabilities that have begun preparing for an A2/AD scenario, the U.S. Air Force must also train and prepare its medical forces for operational scenarios where A2/AD strategies are employed against U.S. and allied combat forces. We must ensure that our

medical personnel are ready and capable to deal with the unique challenges of an A2/AD scenario. Failure to do so may have significant implications for our warfighters, including increased risk for injury and loss of life.

Training is a key factor in ensuring military readiness and to ensuring success in real world military operations. This paper uses the evaluation methodology to evaluate and appraise current Air Force Medical Service (AFMS) training platforms to determine if they meet the anticipated requirements of an A2/AD scenario. A review of the anti-access / area-area denial concept and the history of the Air Sea Battle Office will first be reviewed to understand the development and implications of the concepts. Then these theories will be expounded upon in a review of the concept of operations (CONOPS) Medical Operations in Denied Environments (MODE). An understanding of readiness requirements will then be provided to understand the importance of preparing medical personnel and obtaining the necessary resources. Training programs will then be reviewed and a conclusion will be developed as to whether the current training programs are sufficient to provide medical care in a denied environment.

Some may claim that these additional efforts are unnecessary based on the current political environment or that current medical training is adequate to meet these additional requirements. However, current trends in the political environment indicate an increasing likelihood for potential adversaries to employ A2/AD tactics. Additionally, recent evaluation by the AF planning community has highlighted potential gaps in medical training to meet the challenges inherent in an A2/AD environment.

In an era defined by uncertainty, complex world events, and diminished resources, military leaders must make difficult choices to ensure preparedness for all potential military operations. Diminished resources over the last several years has resulted in gaps in training and

program maintenance in the near term even while we are forced to manage "reduced margin of error in dealing with risks of uncertainty in a dynamic and shifting security environment over the long term."[5]

BACKGROUND

Since the end of the Cold War, the U.S. has enjoyed relatively unrivalled military air, sea, space, and cyberspace supremacy. However, according to the Joint Operational Access Concept (JOAC), there are emerging trends that have the potential to challenge U.S. power. These trends include the growth of A2/AD capabilities and the emergence of both cyberspace and space as contested domains. [6] Often cited exemplars of these trends are nation states China and Russia, as they have increased their A2/AD capabilities and have displayed aggressive military behavior within the global commons. These trends have significant implications for U.S. freedom of operational access and the ability to project the force needed to accomplish its missions.

Within the international community there is growing concern over China's growth of A2/AD capabilities. For over 20 years, China has channeled its economic gains into expanding and modernizing its military. In fact, between 2005 and 2014, China's official military budget increased at an estimated rate of 9.4% per year. While China has improved its military across all domains, experts emphasize evidence of China's military growth in A2/AD capabilities. These include improvements in cyber technology, modern aircraft, naval vessels, and missiles that can prevent adversaries from operating freely in the region.[7] With heavy investments China has transformed itself from a small, ground-focused military into a modernized, "high-technology, networked force with an increasing emphasis on joint operations and naval and air power projection."[8]
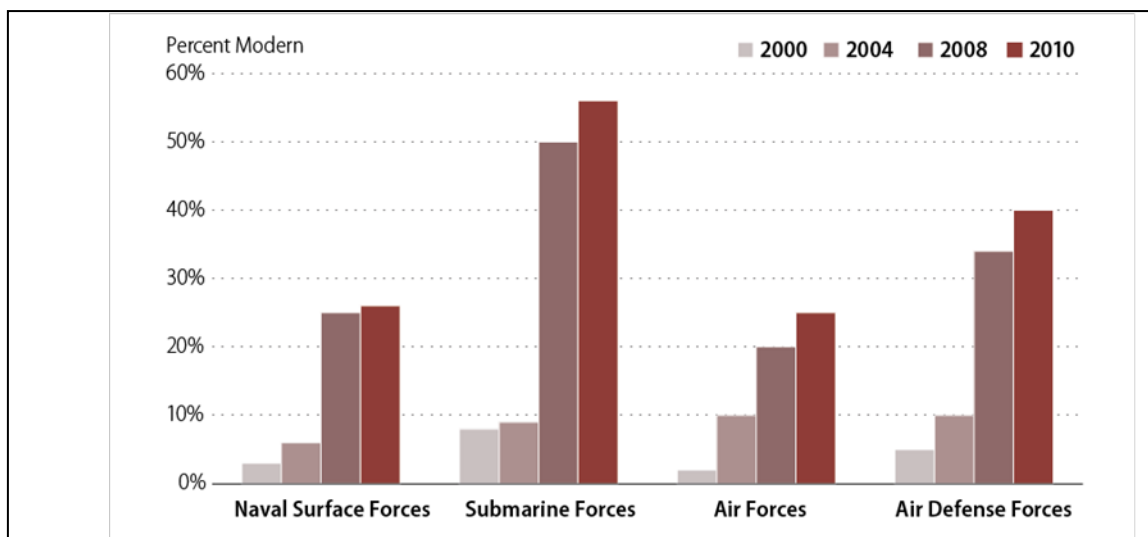
Figure 1. PLA Modernization by Type of Forces, 2000-2010[9]

While China claims its military expansion is for peaceful purposes only, there is increasing evidence to the contrary. Expression of China's military growth and ability to project power can be seen in China's assertions of territorial dominance in the South and East China Seas. The U.S. has seen clear evidence of efforts to restrict access and create no access zones that extend from China to Guam and New Guinea. These efforts come in the forms of restricted air zones and challenges to U.S. aircraft and naval ships in the area. More recently, China has begun a rapid build-up of military bases on reclaimed land in the South China Sea.[10] As of February 2016 China has reclaimed 3,200 acres of land in the South China Sea, which is a substantial increase from 400 acres only one year ago.[11] China has also engaged in a rapid island-building campaign, creating landmasses that can host a variety of maritime facilities, airstrips, and other military structures. From these islands, China would be able to deploy A2/AD capabilities out of the hotly contested islands in the region: the Woody Island in the Paracels and Fiery Cross Reef

in the Spratlys. These capabilities may include UAVs, fighter aircraft, and bombers. Such

capabilities would extend China's power projection reach to be able to strike as far as

Australia.[12]
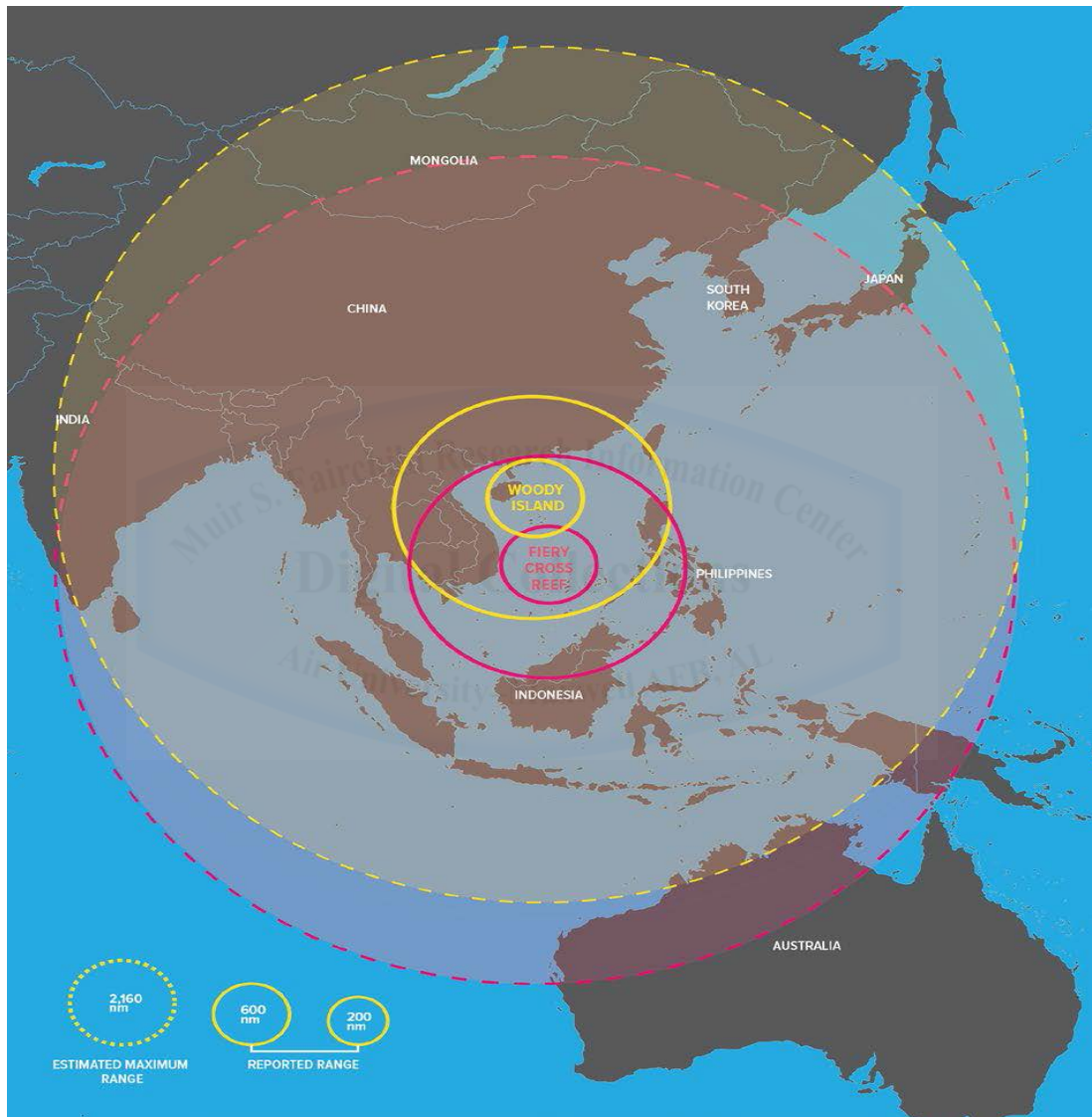
Figure 2. Threat Distance From Woody Island and Fiery Cross Reef[13]

Observers believe China's rapid military modernization and coercive expansion is part of

its strategy to secure its national interests and limit U.S. power in the region.[14] According to the 2015 defense white paper titled *China's Military Strategy*, China's primary military interests are to defend China's sovereignty. This includes militarily addressing any secessionist activities by U.S. ally Taiwan, and defending its territorial claims in the South and East China Sea. Additionally, the white paper indicates China believes U.S. power is on the decline and perceives a favorable shift toward a multipolar world where China is able to assert its status as a leading regional and world power.[15]

China's aggression has substantial implications for regional stability in Southeast Asia. Tensions in the region have been increasing and in Japan's 2015 defense white paper, China was cited as their number one security issue. Likewise, in January 2016, Philippine President announced that $1.77B would be allocated for defense modernization spending, more than the sum of the previous three administrations combined.[16] Regional actors believe China's increased A2/AD capabilities challenge the U.S.'s access and ability to project power in the region. Additionally, China's other neighbors have begun increasing their own military capabilities. Between 2005 and 2009 the amount of conventional weapons systems delivered to Southeast Asian countries nearly doubled.[17] Even with enhanced weaponry, states in Southeast Asia are aware of their continued vulnerability against China's military and economic might. Without U.S. presence and reach, U.S. allies lack assurance that if China does attempt to assert itself militarily, the U.S. will not be able to come to their rescue.

Similar to China, Russia has also come to the forefront of U.S. and allied concerns with its substantial increases in military spending and advancement of A2/AD capabilities. Russian defense spending has increased 31% since 2008 and Russian state defense ministers have called for a comprehensive buildup and modernization of military forces by 2020.[18] These investments

will give Russia technologically advanced precision forces that can conduct operations

throughout the air, land, sea, and cyberspace domains. Russia is using its new capabilities to

expand its reach and power projection around the globe while simultaneously creating anti-

access zones in Europe.[19]

Russia claims its military development and intentions are innocent.[20] However, similar to

China, Russia continues to engage in provocative military actions. Russia has been testing

territorial boundaries in Europe and North America, violating airspace agreements and causing

"emergency scrambles, narrowly avoided mid-air collisions, close encounters at sea and

simulated bombing attacks" that span from the North Sea to the Baltic and Arctic regions and

also along the U.S. coasts.[21] Russia has been engaged in similar activities in Europe with over

100 recorded intrusions recorded between 2014 and 2015. It has also been engaging in

wargames, practicing attacks against NATO warships in the Baltic Sea and promising to arm its

ally Kaliningrad, which borders Poland and Lithuania, with missiles..[22]

Russia's recent military activities in Syria also reflect Russian ambition to increase its

presence in the international arena. Since 2014, the U.S. has been engaged in military operations

in Syria with the aim of fighting "destroying" the terrorist group ISIS while simultaneously

reducing the power of Syria's leader Bashar al-Assad. In an already complex operational

environment with numerous players, the situation has become confounded with the increasing

presence of Russian military activities and influence. Instead of supporting U.S. operations to

fight ISIS, Russia instead has actively targeted U.S. supported militants in an effort to keep its

ally Assad in power. With the U.S. and Russia providing weapons and resources to opposing

actors in support of different goals, a proxy war has developed making a diplomatic solution to

Syria increasingly unlikely to occur.[23]

Russia's actions sound strong alarms for both the U.S. and its allies. According to NATO's top commander, Lt Gen Breedlove, Russia is developing and deploying long-range anti-aircraft defenses to create a "bubble" in the eastern Mediterranean region in an effort to "hinder U.S. and coalition operations in the region."[24] According to Breedlove, one-third of Poland is within Russia's air defense system and other NATO members are within range of its anti-aircraft missiles. With its enhanced A2/AD capabilities Russia has the ability to act aggressively to take control of key components of power within a region while simultaneously denying the U.S. access to intervene. Russia's actions in Ukraine stand as an example of how Russia can move quickly to take control of key transportation routes airspace, effectively controlling the access of U.S. troops and goods into the area. As was exemplified in its conflict with Georgia, Russia's control of the cyber domain can prove to be especially concerning as it can cut off communications from outside forces.[25]

Such actions reflect efforts to gain capabilities that can be used to challenge U.S. military supremacy in the world. The employment of A2/AD tactics impacts the United States' freedom of access needed to accomplish its mission of maintaining stability and the status quo in the world commons. Despite China's military growth and aggressive actions the U.S. is finding it difficult to respond appropriately as it is a strong economic partner and growing presence in the world. While the U.S. is working to shift its forces to the Pacific, U.S. allies in the region are growing increasingly concerned and have responded with their own defense increases. Similarly, Russia's increase in A2/AD capabilities and aggressive territorial actions are generating concerns amongst European allies. The U.S is finding it difficult to respond, however, as Russia's role in Syria and the battles against the Islamic State continue to grow more complicated. The U.S. must address these challenges by preparing to fight in an environment that will have increasingly

opposed operational access. Failing to do so may limit the U.S.'s ability to access its allies and maintain a peaceful status quo.

Air-Sea Battle Concept

In response to the signs of growth and power projection, in 2009 the Secretary of Defense directed the Air Force and the Navy to study the A2/AD issue and to determine methods for preserving access to areas of common interest for the U.S. and its allies. In 2010 the *Center for Strategic and Budgetary Assessments (CSBA) published AirSea Battle (ASB): A Point of Departure Operational Concept*. The CSBA's paper led to the creation of a joint-service ASB office with the aim of supporting the US strategic mission of maintaining stability in the global commons. The focus of the ASB office was to develop a conceptual framework for responding to China's aggressive behavior. Building on the work of the CSBA, in 2013 the ASB office published *Air-Sea Battle: Service Collaboration to Address Anti-Access and Area Denial Challenges*. In this new publication, the ASB expanded their analysis to include not only China, but anyone that would challenge the United States and its allies by restricting access or denial of maneuver in the global commons.[26]

In January 2015, the ASB office was renamed the Joint Concept for Access and Maneuver in the Global Commons (JAM-GC). This shift is in recognition of how certain skills that may be required in an A2/AD scenario have deteriorated because those skills were not needed in Operation Iraqi Freedom or Operation Enduring Freedom.[27] The goal of the new JAM-GC office is to take the original A2/AD concepts and to refocus efforts to build the necessary capabilities to meet such threats.

Anti-Access (A2) / Area Denial (AD) Concept

As defined by the ASB concept, A2 is considered attempts by an adversary to slow the

deployment of forces into a location or to cause those forces to operate farther from a conflict than is preferred. A2 affects movement to an operational theater. AD is when an adversary takes action to impede maneuver, or movement, within the theater.

In the current operating environment, the United States and its allies enjoy air superiority and unparalleled weapons technology. U.S. military combat operations are deployed through a network of prepositioned assets, supported by intra-theater air mobility that enables assets to reach targets within the enemy's territory. Enemy technology and weapons development have lagged behind, providing the U.S. with the freedom to move forces between main and forward air bases ability and the ability to reach safe havens behind enemy lines.

In an A2/AD environment, the adversary is able to shift the operational warfighting elements to its favor, effectively nullifying the U.S.'s traditional model of expeditionary force build up and attack at its chosen time. The enemy will achieve enhanced missile strike capabilities with increased "range, depth, and accuracy to strike bases and ships in the joint operational area (JOA)… at distances that have historically been safe from this threat."

According to the ASB office's concept implementation summary, four operational assumptions are anticipated as to how an enemy will employ A2/AD capabilities: First, an enemy is expected to engage in adversarial military activities with little warning. Second, the expectation is that without any warning, there will be friendly forces in the area when the adversary begins an attack. Third, the U.S. must anticipate the adversary will attack U.S. and allied territories, resulting in a need to prioritize defense of the homeland and operations overseas simultaneously. Fourth, it can be expected that the adversary will attack all domains, to include cyberspace, space, air, maritime, and land. Finally, all domains must be protected and

none may be completely yielded to the enemy. All domains are interconnected and the complete loss of one will compromise the other domains.[28]

The ASB solution to A2/AD challenges in the global commons "is to develop networked, integrated forces capable" of far-reaching strike abilities to "disrupt, destroy, and defeat adversary forces." Integration and effective networking of forces must occur at all levels of the warfighting domains in order to defeat the adversary's capabilities and provide "maximum operational advantages" to the U.S. and allied forces.[29] Integral to the ASB solution is the integration of air, naval, land, space and cyber platforms to ensure capabilities are expressed in an optimal way. Ultimately, the goal of the ASB concept is to preserve freedom of action in for responding to an A2/AD scenario which would allow the military to project power despite actions to restrict access and maneuver.

Medical Operations in Denied Environments (MODE)

The demand for military planning, preparedness, and readiness applies to all departments and functions of the military, including the Military Health Service (MHS). While efforts to counter A2/AD threats have been developed for several years, only recently has the MHS been called upon to begin planning for an A2/AD scenario. In 2014 the Air Force Medical Service (AFMS) identified medical care in the A2/AD environment as the number one Doctrine, Organization, Training, material, Leadership and Education, Personnel, Facilities and Policy capability shortfall. [30] Due to evolutions in combat medicine the U.S. military is currently experiencing the highest casualty survival rate in history.[31] However, the unique requirements present in an A2/AD scenario will greatly test the abilities of military medical personnel to reduce mortality and injury rates.

Strategists have recently developed a Concept of Operations (CONOPS) to guide future

planning, appropriately called Medical Operations in Denied Environments (MODE). This CONOPS highlights the unique struggles faced by the medical field in providing medical care to troops in an A2/AD environment. It also identifies requirements to effectively reduce mortality, support combat operations, and provides recommendations for future planning and preparation.

Air superiority and technological dominance have allowed U.S. medical forces to operate with relative safety from enemy attacks. Currently, the U.S. enjoys air dominance within the global commons. Air dominance allows for uninterrupted air refueling and medical transport, which are critical to moving patients away from the front lines to a safe zone. The traditional U.S. model for engaging in combat operations is based on access to prepositioned assets and intra-theater mobility to transport and sustain combat forces between main operating bases and forward operating bases in the theater. Air dominance and underdeveloped adversary air precision technology has protected U.S. and allied bases and air forces from adversary attacks.[32]

It has become clear, however, that potential adversaries such as China and Russia are quickly gaining the ability to change the status quo. Their recent aims to gain technologically advanced weapons systems and modernize their military forces have the potential to put U.S. air superiority and the safety of main operating bases at risk. Without air superiority, the U.S. cannot guarantee safe patient transport and the safety of bases behind enemy lines where patients can be treated.

Currently, due to air superiority and freedom of action U.S. forces are able to access the theater of operations, allowing medical treatment and staging to exist relatively close to combat zones. In an A2/AD environment however, the distances between the area of operations and medical forces behind enemy lines will be greatly increased. This puts patients at increased risk of mortality during transport as there will be increased time and distance to higher level medical

facilities. Additionally, aircraft used for patient transport may not be available due to higher mission priorities, increasing wait times for patients in the field.

Air superiority and the relative safety of bases behind enemy lines ensure that there will be free access to logistical supply lines. Currently U.S. medical forces have adequate fuel, medical supplies, and augmentee support. This access will be compromised in an A2/AD environment as enemies will have the ability to access supply lines and attack with enhanced weapons precision. Medical personnel may experience a dearth of medical supplies on the field to treat patients. This will increase the risk of permanent injuries and deaths of combat forces.

AF planners anticipate a rapid escalation of conflict which will rapidly generate substantial casualties. Simultaneously, as a result of enhanced enemy weapons and modernized forces, air superiority is at risk, allowing adversaries to see our actions and strike with precision at our medical bases that were previously safe from attack. Medical personnel can anticipate limited medical response capabilities, unreliable access to supply lines, reduced patient movement, and increased patient evacuation times.[33] The rapid of escalation of conflict and A2/AD capabilities will mean that medical forces will be difficult to deploy rapidly and it will be difficult to establish medical facilities near the operating theater.

According to MODE, adversaries are unlikely to discriminate between combat and medical forces providing care, and will likely plan to target even civilian populations. This level of violence has been evidenced by the recent targeting of hospitals and health care centers in Syria, which is likely attributable to Russia and the Islamic State.[34] As a result, medical personnel will experience high-volume triage scenarios with reduced access to supplies and additional support. Effective critical combat care (CCC) will be confounded by the adversary's advantages in an A2/AD scenario

MODE offers strategies to mitigate the unique requirements of an A2/AD scenario. A fundamental component for reducing mortality in MODE is the development of networked and integrated medical forces that are able to maintain enhanced capability and capacity for care at all levels. The concept requires that military forces operate in a manner that is mutually supportive across all domains in order to deliver flexible care and stabilize, group, and evacuate casualties to higher levels of care.

Readiness and AF Training Programs

The 2014 Quadrennial Defense Report (QDR) defines readiness as "the ability to provide and integrate capabilities required by the Combatant Commanders (CCDRs) to execute their assigned missions." Readiness is an integral component of the AFMS mission. According to Title 10 requirements, the AFMS must provide support to the AF and CCDRs in support of U.S. goals across the full spectrum of military operations, to include expeditionary deployment operations, humanitarian assistance efforts, and global health engagement to support building partnerships and stability operations.

Significant to the AFMS is that it is the executive agent for providing aeromedical evacuation (AE). The AE system provides time-sensitive, en route medical care to patients as they are transferred between MTFs. USAF medics are specially trained to operate on a global AE system. This system is comprised of ground forces providing care within an MTF, patient-staging platforms and in the air. The AE system is flexible enough to provide care across the full spectrum of military operations, to include humanitarian assistance and disaster response.[35] The USAF provides trained AE personnel and flight nurses that must have the training necessary to provide care in non-traditional medical locations such as on board mobility aircraft where room and supplies are limited.

AE will become especially difficult in a MODE environment. Planners anticipate that medical forces will experience mass casualty scenarios, longer wait times for available aircraft to transport patients, and also longer transport times from the combat field back to a medical facility where medical care can be provided in a safe environment. Medical forces will have to operate in scenarios where supplies are limited and where medical forces themselves are likely to be targeted, creating a challenging operating environment. To overcome these challenges, the AFMS must ensure Air Force medics are optimally "ready" with the necessary skills, training, and resources to support the entire spectrum of military operations across the globe.[36]

The range of skills required to support military operations is what makes military medical readiness different from other military readiness requirements. Military medical personnel must have medical training, clinical experience, military training, and also military experience. Similar to the civilian sector, military personnel obtain and maintain their clinical skills through medical school and by providing clinical care to active-duty members in-garrison. However, those military medical members that perform wartime medicine while must also have the necessary specialized skills and proficiencies to working in a vastly different operational environment. Civilian doctors do not have the training or skills to treat military-specific conditions such as aerospace operations, aeromedical evacuation, or stabilizing combat casualties. As these requirements are unique, military personnel must receive a mix of both clinical and wartime medicine training while assigned to military treatment facilities (MTFs). In addition, military personnel must receive military training, with basic tactical and survival skills. Often military medical personnel must work in austere environments with limited resources. This unique combination of requirements makes achieving the right personnel with sufficient medical readiness especially challenging.[37]

AF planners use unit type codes (UTCs) to identify the total manpower and logistic requirements needed to support and execute a military capability. The AF uses Air Force Specialty Codes (AFSCs) as a manpower-classification system to group together personnel that have similar duties, skills, and required training. The Air Force uses AFSCs to identify which Airmen will be needed in a deployment scenario fulfill a UTC capability. Personnel with AFSCs that have UTC designations have unique readiness requirements as they will need to have the skills necessary to support specific military operations. The AFMS has over 200 UTCs.

Within the AFMS, readiness is developed with two foundational components: individual readiness skills training and clinical currency. Individual readiness is achieved through the Readiness Skills Verification Program (RSVP). Established in 2001, the program establishes the minimum specific skills required for each AFSC to perform essential tasks in deployed environments. There are 73 unique RSVP checklists which manages the "clinical currency" necessary for clinical medical care in-garrison to take care of active duty members. Clinical currency is defined by the AFMS as the quality of being up-to-date. Currency is the foundation of readiness, as you must achieve and maintain a certain level of clinical currency before being for readiness training to be effective. Consultants and career field managers decide what currency skills are needed for each AFSC to perform optimally within the RSV program. These requirements then become the basis for all clinical currency training specific to those AFSCs.
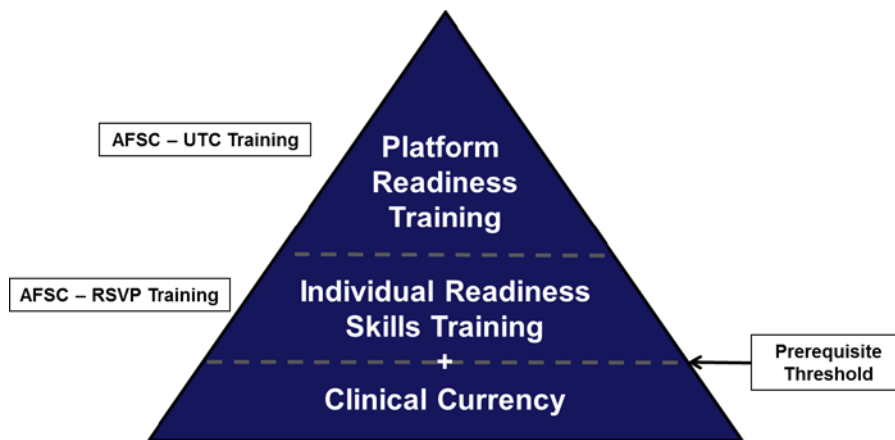
Figure 3: Readiness – Currency Training Relationship

Upon entering the AF, Airmen are either trained to meet the initial proficiency levels of their role or they enter the AF with the credential required to fulfill their AFSC-specific credentials. The Sustained Medical and Readiness Training program (SMART) program is a centrally managed process that provides tiered and currency training necessary to maintain trauma and non-trauma skills for personnel at all MTFs. An important component of the SMART program is that it utilizes both internal and external training resources to provide a standardized curriculum of clinical experiences that is specific to each AFSC.[38] The SMART program allows medical personnel to maintain their currency and complete RSV training.

Currently, the Air Force is in the process of transitioning from the Sustainment of Trauma and Resuscitation Skills Program (STARS-P) to the SMART program. As a predecessor to the SMART program, the STARS-P mission was to create and maintain the currency and readiness skills of personnel assigned to specific deployable UTCs. The intent of STARS-P was to provide standardized training curriculum that emphasized continuous hands-on care at local civilian trauma centers with simulation opportunities for group training and unavailable first-

hand skills training. Key to the success of the program was the goal of creating a standardized curriculum. However, standardization was not possible because each site created and executed curriculum at a local level. A 2012 review of the STARS-P program determined that success at each site was variable, with staff not being embedded with the trauma centers and authorized personnel not all being used for the program as initially intended. Through a review of lessons learned and future requirements, the SMART program was developed.[39]

The SMART program's intent is to provide centrally-managed, standardized, tiered training for skills that are not performed routinely. The SMART program relies on maintaining the currency of previously learned skills and building on them through hands-on training at medical facilities and through distance-learning training modules. The program provides a standardized curriculum defined within the CONOPS as a SMARTbook. The SMARTbook delineates the necessary skills each AFSC must maintain in order to execute the mission as tasked by the Joint Force Commander.

The SMART program directs a three-tiered approach to achieving the skills training necessary to meet that AFSC's readiness requirements. The different tiers provide different levels of complexity for military medical currency and training. Tier I training maximizes the routine operations that are organic to a medical treatment facility to maintain clinical currency and RSV skills. Currently there are 13 in-patient medical treatment facilities and 63 outpatient medical treatment facilities within the AFMS. With the Tier I program additional training can also be provided with medical simulation. Tier I emphasizes the importance of the medical personnel seeking currency opportunities and the medical commander ensuring that staff capitalize on them.

Tier II of the SMART program depends on partnerships with local civilian clinics,

hospitals, trauma centers, as well as AF/Veterans Affairs (VA) training centers. The AF currently has six such partnerships: University of Nevada Surgical Residences and Surgical Simulations Lab, SouthWest Texas: Critical Care and Emergency Thinking, UAV: Trauma Orthopedics, Emergency & Critical Care Training, Keesler: Cardiology and Orthopedic Surgery, Travis: Cardiothoracic & Orthopedic Surgery, and a partnership with the National Health Service at Lakenheath to provide Emergency, ENT, Orthopedic, and General Surgery experiences. An effective partnership with regional medical centers requires that a memorandum of agreement (MOA) be agreed upon by all participants and adhered to. The MOA with the regional medical facility must provide hands on currency opportunities in all departments in an effort to reduce currency gaps.

Tier III of the SMART program emphasizes the use of regional currency centers that have a Level I/II trauma centers. These centers can provide the necessary training opportunities for skills that cannot be obtained through other means. Training at these locations provides medical personnel with opportunities to train on more difficult illnesses/higher-acuity patients. As with the second tier, Tier III emphasizes the importance of a MOA that allows medical personnel to train there. Airmen who complete the SMART program will have acquired the essential clinical capabilities necessary fulfill UTC requirements.

As part of Tier III level of training, the AF provides offers the Center for the Sustainment of Trauma and Readiness Skills (C-STARS). C-STARS is a regional training platform that trains medical personnel with the designated UTCs and AFSCs that require pre-deployment training focused on advanced trauma and stabilization skills. The C-STARS program assumes those who take the program are already clinically current and it builds upon those capabilities. Training is required every two years for providers, nurses and technicians with applicable UTCs. C-STARS

23

platforms currently exist in St Louis, Baltimore, and Cincinnati. The training is essential for military personnel to learn how to quickly and effectively respond to critical medical scenarios. Trainees experience unique situations that "sharpen and refresh medics' trauma care currency, increase their knowledge base, and help them become even more competent and confident."[40]

To support its AE mission, the AFMS provides expeditionary platform-based readiness training. This training is AFSC specific and applies only to specific UTCs that deploy. These formal training platforms include Critical Care Air Transport Teams (CCATT), Aeromedical Evacuation & Patient Staging (AEPS), and, Expeditionary Medical support. The CCATT program is essential in patient movement in combat operations. The CCATT mission is to serve as a "limited, rapidly-deployable resource available… to supplement en route care patient movement capabilities." They engage to provide care to the patient after the patient has received the initial stabilizing care by ground medical support. [41]

ANALYSIS / DISCUSSION

The military health system has three primary missions: maintain the health of its active-duty force, provide peacetime healthcare to its dependents and retirees, and maintain a trained, ready, and deployable medical force. In order for it to achieve these missions, four integrated inputs are needed: medical facilities, trained and ready medical personnel, funding, and a diverse patient population that will provide the necessary workload for medical personnel to maintain their clinical skills. These four inputs enable the medical components to achieve their three primary missions.
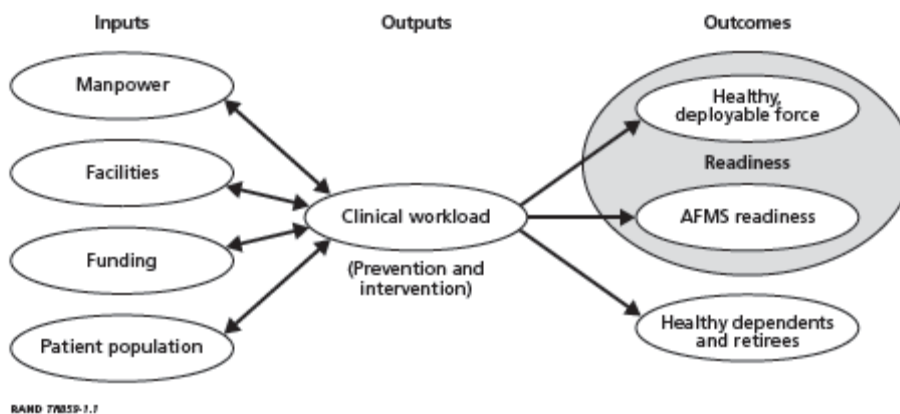
Figure 4: Inputs, Outputs, and Outcomes of the Military Health System[42]

The AFMS is experiencing several challenges that impede it from ensuring its medical personnel are ready to support medical operations in denied environments. Significant to maintaining the currency of medical personnel, the AFMS is currently facing a decline in its patient workload. Additionally, while the recent development of the SMART program emphasizes partnerships with other military and civilian institutions to provide training opportunities on patients with more complex illnesses, many still consider training in civilian hospitals to be inadequate compared to providing medical care in austere combat environments. Finally, MODE presents a unique scenario for which the AFMS has not yet developed the needed capabilities to provide effective medical support.

Loss of Patient Care and Currency Opportunities

For military medics to maintain currency, they must provide medical care to a sufficiently large patient population with diverse medical issues. Problematically, the AFMS has seen a significant reduction in its patient population. In 2007, the AFMS performed 37 percent

fewer inpatient procedures and conducted 31 percent fewer outpatient procedures than in 2000.[43] The reductions in patient workload have resulted in reduced funding, which ultimately have had a compounding effect on workload losses. According to a 2010 RAND study, the reductions in workload are as a result of reductions in medical facilities, changes in healthcare beneficiary policies, and inadequate medical manpower.

Since 1995, the AFMS has reduced 45 inpatient facilities that served as readiness platforms. These reductions were taken as part of an overall drawdown of military forces after the end of the Cold War. With the Soviet Union no longer posing a threat and the preeminent success of U.S. forces in the Gulf War, the U.S. government and the DoD believed the military footprint could be reduced and efficiencies gained. The belief by the military services was that the DoD could rely on the civilian medical network for inpatient services and shift its military medical personnel to locations with more diverse workloads to increase their currency opportunities. The loss of the medical facilities and the shift in workload to private sector care decreased the available patient population, reducing currency opportunities for AF medics.

Increases in deployments and a decrease in the total number of available medics since 2000 resulted in less manpower to support an inpatient population. As a result of the wars in Iraq and Afghanistan, more medical personnel were deployed to support combat troops. Unlike the other Services, the AFMS does not assign medical technicians and medics to operational units. Instead, aside from AE squadrons and deployed medical squadron units, they are assigned almost exclusively to the MTF. The AFMS deploys its medical personnel out of its pool of manpower assigned to medical facilities. Therefore when medics and technicians deploy, a manpower gap is often left at the inpatient facility, reducing availability for patient care. While backfills, or manpower to replace gaps due to deployments, are available, they are often difficult to put in

place and train to adequately meet the needs of the MTFs. Over time, those potential patients have sought care in the private sector, ultimately reducing patient workload for AFMS medics.

An additional factor causing a decrease in the patient for life is the effects of the TRICARE for Life (TFL) beneficiary policy. Implemented in the 2001 National Defense Authorization Act, TFL reduced the cost of care for retirees aged 65 an older to use a civilian physician. This act reduced incentives for retirees in this age group to use military medical services instead of private sector care. This segment of the population accounted for ~28 percent of the AFMS inpatient workload in FY07. As a result of the TFL policy and the deployed medical personnel, the AFMS lost the workload of patients with particularly complex health needs.[44]

While the AFMS has concentrated on its remaining inpatient facilities to maintain medical currency and to increase patient care, the impacts of the closures of inpatient platforms, deployed personnel, and the implementation of TFL continues to impact patient numbers and currency opportunities. In 2013, as a result of the Budget Control Act which sharply reduced funding for military services, the Defense Health Agency looked to the AFMS for another round of MTF closures based on perceived low workload.[45] Maintaining a patient workload sufficient to provide currency is essential in ensuring medical personnel are ready to meet the challenges of MODE.

Training at Civilian Institutions

The SMART program was developed by the AFMS to address the lack of inpatient hospitals available to provide currency opportunities for AFMS medics. Additionally, while there is some overlap between peacetime healthcare at the MTF and injuries among combat troops wounded in action. An important part of the SMART program is the third tier of its

platform that focuses on pairing up with civilian trauma centers. Training at these centers is for medical personnel with the designated UTCs that require pre-deployment training focused on advanced trauma and stabilization skills. These agreements are critical as training at these hospital centers does offer more opportunities to practice on patients with more complex issues.

Experienced military medical personnel would argue that "while some similarities exist, out-of-hospital care in combat settings often differs radically from civil sector practice in the U.S."[46] In a military operation combat care providers must deal with complex operating environments. This is especially true in an A2/AD combat environment, as planners anticipate that the number and severity of casualties can exceed what has been experienced in recent years. Medics in combat scenarios can face difficult scenarios such as taking care of wounded while facing enemy fire. Military medics must also be able to focus on the patients' needs while also having to consider the combat unit's integrity and overall mission. Combat medics are likely to encounter mass and multiple-injury casualty incidents and patients with catastrophic wounds as a result of penetration trauma and blast injuries. In combat scenarios, casualty evacuations are longer in distance, duration, and medics must operate with limited supplies. The extreme conditions present in a combat environment are drastically different from those experienced in a civilian hospital, even in trauma centers.

Training in civilian hospitals also does not provide the necessary training needed to work effectively in a Joint combat operation. The MODE CONOPS emphasizes the importance of integrated Joint training. To support truly integrated joint training, forces must be able to organize and train to "instinctively function together, with an integrated capability set."[47] According to the CONOPS, true integration is when all the players know how to work together and in a short amount of time are working effectively and efficiently to stabilize patients from a

mass casualty event. Even though they are separate forces, they must have the training in a way that allows them to integrate and form in a way to be effective and then disband as required by the mission.

Due to the importance of true Joint integration, training must be structured support this concept. Additionally, the MODE CONOPS notes that training cannot be just in time training for it to be effective. Instead, training will need to be ongoing and continuous to demonstrate proficiency through integrated field exercises. Training in a civilian hospital cannot recreate this type of working environment.[48]

Finally, MODE offers new and unique options to mitigate the negative characteristics of an A2/AD environment. As these strategies are new, training programs have not yet been developed. To mitigate the impact of enemy missile strikes, MODE recommends a unique cluster-based medical system with mutually supporting forward resuscitative surgical capabilities.[49] This cluster medical system will allow for the placement of dispersed treatment facilities that maintain a light footprint and can shift rapidly within the cluster. Such a system will require tightly integrated medical specialists with access to telemedicine, and intra-cluster evacuation and en-route critical care.

MODE also proposes a unique patient evacuation system that is a significant departure from the traditional model. The current patient evacuation system will not be effective in an A2/AD scenario as military personnel are not fully integrated, waiting times will be increased, as well as transportation times. In the MODE model, patients are assessed and treated across appropriate levels of care. After life-saving care is provided at the injury site, patients are moved to the next level of care which is usually a military combat or theater hospital. Patients whose injuries are severe enough to prevent a return to active duty are then evacuated to the next level

of care.[50] Medical planners must develop training programs to prepare military medical personnel for these new scenarios.

CONCLUSION

MODE presents unique operational requirements that U.S. medical forces have not yet experienced and thus they are untrained to fight in contested environment. Currently the U.S. military enjoys air superiority, assuring the safety of bases behind enemy lines, close access to medical facilities in the field, and relatively speedy patient evacuation. Technological advances and the modernization of adversary weapons systems have the potential to challenge U.S. air superiority.

To mitigate the negative impacts of MODE and to reduce the risks for combat troops, military medical services must prepare for such a scenario by reducing gaps in capabilities. A2/AD has new, unique, and continuously evolving challenges. A significant component to preparing for an A2/AD scenario is ensuring military medical personnel are sufficiently trained to support combat troops. Recognizing this, the MODE CONOPS specifically emphasizes the need to evaluate "clinical and medical readiness training to determine where training gaps exist in preparing medical personnel for patient care operations in contested environments."[51]

Due to a decreased patient population, the inadequacy of training in civilian institutions, and the unique requirements proposed in MODE, this research paper concludes that current AFMS training is inadequate to support future combat operations in denied environments. The AFMS must work to develop training programs to adequately prepare for providing medical care in denied environments.

NOTES

(All notes appear in shortened form. For full details, see the appropriate entry in the bibliography.)

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